

SIMTEK6701

IN THE UNITED STATES PATENT OFFICE

CENTRAL MAIL CENTER


JAN 20 2006

In re Application of
Akira Masaoka et al

App. No.: 10/605843
Filed: 10/30/2003
Conf. No.: 2842
Title: KICKBACK PREVENTING CIRCUIT
FOR ENGINE
Examiner: M. Gimie
Art Unit: 3747

I hereby certify that this correspondence and all
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January 20, 2006


Ernest A. Beutler
Reg. No. 19901

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

APPELLANT'S BRIEFREAL PARTY IN INTEREST

In addition to the appellant, the real party in interest is his assignee, Kabushiki Kaisha Moric, a Japanese company.

RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences that would have a bearing on or be affected by the decision in this appeal.

STATUS OF CLAIMS

Claims 1 through 17 remain in this application and all are before the Board on appeal.

STATUS OF AMENDMENTS

An amendment was filed after the issuance of the Final Rejection, for provoking an interference with US Patent 6,786,212, cited in this case, but not applied. No other amendment was proposed in response to the Final Rejection and entry of the amendment copying a claim was denied. Therefore the claims before the Board are as appealed.

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App. No.: 10/605843
Filed: 10/30/2003
Conf. No.:2842

Page 2 of 9

SUMMARY OF CLAIMED SUBJECT MATTER

Claims 1 and 12 are the only independent claims before the Board and these are parallel, respective method and apparatus claims. Claim 1 is set out below in paragraph form and is annotated to point out the element or method in the drawings and the related description in the specification.

The claims recite either a method or system for operating an engine shown only schematically in the drawings and having an ignition circuit, indicated in the drawings generally by the reference numeral 15, described first in Paragraph 0015 for firing a spark plug, indicated by the reference numeral 21, described first in Paragraph 0016. The ignition circuit 15 is powered by an engine driven electrical generator, identified generally by the reference numeral 11 as described first in paragraph 0014 of the specification.

The engine is started by a starting device which cranks the engine crankshaft that is not shown in any of the manners described in Paragraph 0020, such as starter motors, kick starters cranks or pull ropes. Upon initial starting, ignition is permitted as described in this Paragraph.

Then the kickback preventing circuit, identified by the reference numeral 22 and first described in Paragraph 00017 and in more detail in Paragraph 0019 with its operation being described in Paragraph 0020 and those following it. This operation includes monitoring the engine speed to determine if the speed is decreasing from a previously sensed speed so that reverse rotation may be beginning as described in Paragraph 0021 and those following that describe several conditions where this may occur.

If this is determined, the firing of the spark plug is prevented as described in Paragraph 0029.

Other distinctions called out in the dependent claims which do not stand or fall with claims 1 or 12 respectively will be discussed in more detail when those claims are discussed separately in the Arguments section of this brief.

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

The grounds of rejection that the Board must determine are whether the Examiner has made out a prima facie case that Claims 1 and 2 are anticipated under 35 USC 102(b) by U S Patent 6,435,158 (Mingo et al) and whether he has made out a prima facie case that the subject matter of claims 3-17 is obvious under 35 USC 103(a) from an obvious combination of Mingo et al with U S Patent 5,020,506 (Ozawa).

App. No.: 10/605843
Filed: 10/30/2003
Conf. No.: 2842

Page 3 of 9

APPELLANT'S ARGUMENTS

Claims 1 and 2 are not anticipated

It is readily admitted that both appellants' device and method and that of the Mingo et al reference are intended to prevent reverse rotation of an engine. However this is not what appellants are claiming. What they claim is a method and apparatus that is very effective in preventing reverse running under all conditions after starting has been initiated. The Mingo reference does not even begin to sense possible reverse engine rotation until after it has been determined that the engine is in fact running and the starting operation has been completed. In this regard the Board's attention is directed to the paragraph describing the operation of FIG.8 appearing at column 5, line 64 where it is stated:

"In accordance with step 804 when the engine speed is less than or equal to the first engine speed threshold (FNSTARTRPM), as shown in FIG. 7, and the starter has been disengaged, (step 806) then an "imminent stall" condition is inferred and the controller sets a corresponding flag (SPK_KILL_FLG="1"), step 808. The controller then issues a spark drop request to the vehicle's spark control module (EDIS) step 810 and fuel supply is disabled by the controller (step 812)."
(emphasis added)

This same requirement of starter disengagement before reverse rotation protection is also emphasized in each claim of the reference as follows:

"suspending operation of the engine based on the operational state of the starter motor and whether or not the stall condition is inferred".

Furthermore the stall condition is inferred not from a decrease in speed from a previously measured speed as specifically claimed by appellants, but "when the engine speed is less than or equal to the first engine speed threshold". Thus the claims are not anticipated and the 35 USC 102 rejection has not been prima facie case established. The difference is also important because appellants' device and methodology is much more responsive in protecting against any reverse rotation after starting is initiated not after it is completed.

In addition to the aforementioned very material differences, claim 1 also distinguishes in calling for "an electrical generator driven by the engine". Since anticipation requires complete anticipation the rejection of claim 1 on the reference can not be sustained as there is no reference in Mingo et al to an electrical generator.

App. No.: 10/605843
Filed: 10/30/2003
Conf. No.:2842

Page 4 of 9

Claim 12 is not obvious under 35 USC 103

It is also pointed out to the Board that method claim 12 which parallels article claim 1 has not been rejected as anticipated. Thus at least as to that claim he has admitted lack of anticipation. The secondary reference to Ozawa does not cure the rejection for the reasons noted above with respect to claim 1.

Claims 3 and 8 are not obvious under 35 USC 103

Claim 3 depends on claim 1 and claim 8 depends on claim 7 and also requires the engine speed to be determined from the output of the electrical generator, which as noted above is lacking in Mingo et al. The Examiner refers to Ozawa as utilizing a pulser coil and refers to an electrical generator. However it fails to teach the determination of speed from the generator output and thus lacks a teaching to lead one skilled in the art to make the combination.

Claims 4, 9 and 13 are not obvious under 35 USC 103

Claims 4, 9 and 13 depend directly on claims 3, 8 and 12, respectively and call for the firing of the spark plug to be deferred after starting operation until the engine reaches a predetermined speed. This offers further protection against reverse rotation during the starting operation. It has already been noted that Mingo et al does not begin reverse rotation protection until after the starter has stopped operation, thus it can not meet this limitation and in fact fires the plug immediately upon starting. Ozawa does not cure this defect.

Claims 5, 6, 10, 11 and 14 are not obvious under 35 USC 103

Claims 5, 10 and 14 depend directly on claims 4, 9 and 13, respectively and further distinguish in calling for the speed at which reverse rotation is determined is one lower than that at which the initiation of plug firing during starting operation is initiated. To read on the combination this would have to be a reverse running condition since the Mingo et al reference, as previously noted begins plug firing upon starting rotation. Claim 6 depends on claim 5 and claim 11 depends on claim 9.

Claim 7 is not obvious under 35 USC 103

Claim 7 depends on claim 1 and adds to it the timing mark and related pulser coil and requires that ignition is not permitted until the pulser coil outputs a first signal. The Examiner has not addressed this limitation, obviously because the art alone or in combination does not teach this.

Claims 15-17 are not obvious under 35 USC 103

Each of these claims particularly calls out specific details of the electrical circuitry and differ from each other even though they depend in series. The Examiner has made no showing as to how he contends the combination relied upon supports his rejection and absent that he must be reversed.

App. No.: 10/605843
Filed: 10/30/2003
Conf. No.: 2842

Page 5 of 9

SUMMARY

In summary and for the reasons stated above, a complete reversal of the Examiner's rejections is respectfully requested. A credit card authorization for the Brief Fee is attached.

Respectfully submitted:



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App. No.: 10/605843
Filed: 10/30/2003
Conf. No.: 2842

Page 6 of 9

**APPENDIX
CLEAN COPY OF CLAIMS ON APPEAL**

1. A method of preventing reverse rotation in a spark ignited internal combustion engine having at least one spark plug fired by an ignition circuit and having an electrical generator driven by the engine and a starting device for cranking the engine for starting thereof, said method comprising the steps of permitting firing of the spark plug after the starting device is initially operated, determining after the starting has been initiated if the speed of the engine has decreased from a previously sensed speed sufficiently that the engine may be starting to rotate in a direction opposite to that desired, and thereafter preventing firing of the spark plug.

2. The method as set forth in claim 1, wherein once the firing of the spark plug has been prevented the spark plug is not permitted to fire again until another starting operation is initiated.

3. The method as set forth in claim 1, wherein the speed of the engine is detected by the output of an electrical generator driven by the engine.

4. The method as set forth in claim 3, wherein the firing of the spark plug upon starting is not permitted until the speed of the engine reaches a predetermined first value.

5. The method as set forth in claim 4, wherein the firing of the spark plug is prevented when the speed of the engine falls below a second predetermined value lower than the first predetermined value.

6. The method as set forth in claim 5, wherein once the firing of the spark plug has been prevented the spark plug is not permitted to fire again until another starting operation is initiated.

7. The method as set forth in claim 1, wherein the engine ignition system includes a timing mark driven by an engine shaft and a pulser coil for providing an output signal in response to the position of the timing mark to determine the time of firing the engine and the ignition of the spark plug is not permitted until the pulser coil outputs a first signal.

8. The method as set forth in claim 7, wherein the speed of the engine is detected by the output of an electrical generator driven by the engine.

9. The method as set forth in claim 8, wherein the firing of the spark plug upon starting is not permitted until the speed of the engine reaches a predetermined first value.

10. The method as set forth in claim 9, wherein the firing of the spark plug is prevented when the speed of the engine falls below a second predetermined value lower than the first predetermined value.

11. The method as set forth in claim 10, wherein once the firing of the spark plug has been prevented the spark plug is not permitted to fire again until another starting operation is initiated.

12. An ignition and anti reverse running system for an internal combustion engine comprising a pulser coil for generating a pulse in response to the passage of a timing mark associated with a shaft

App. No.: 10/605843

Page 7 of 9

Filed: 10/30/2003

Conf. No.:2842

driven by the engine, an ignition circuit for receiving the pulse and initiating the firing of a spark plug of the engine, an ignition preventing circuit for preventing the firing of the spark plug by said ignition circuit when the speed of the engine falls below a predetermined speed after the engine has been initially cranked for starting thereof.

13. An ignition and anti reverse running system as set forth in claim 12, wherein the engine drives an electrical generator and the speed of the engine is determined by the output of said electrical generator.

14. An ignition and anti reverse running system as set forth in claim 13, wherein the ignition circuit is prevented from firing the spark plug by the ignition preventing circuit until the speed of the engine reaches a predetermined first value and the firing of the spark plug is prevented when the speed of the engine falls below a second predetermined value lower than said first predetermined value.

15. An ignition and anti reverse running system as set forth in claim 12, wherein the electrical generator has a plurality of phases and the speed of the engine is determined by a summing circuit that sums the output of at least two of said phases.

16. An ignition and anti reverse running system as set forth in claim 15, wherein the summing circuit comprises reverse current preventing diodes each receiving the output of a respective phase of the electrical generator, a capacitor charged by the electrical generator output, and a resistor connected between the capacitor and a reverse revolution discriminating circuit.

17. An ignition and anti reverse running system as set forth in claim 16, wherein the reverse revolution discriminating circuit comprises a flip-flop circuit connected to a pulse receiving circuit receiving the output of the pulser coil and a transistor circuit connected between said flip-flop circuit and the resistor of the summing circuit.

App. No.: 10/605843
Filed: 10/30/2003
Conf. No.:2842

Page 8 of 9

COPIES OF EVIDENCE SUBMITTED
AND RELIED UPON BY APPELLANT

None

App. No.: 10/605843
Filed: 10/30/2003
Conf. No.:2842

Page 9 of 9

COPIES OF DECISIONS
IN RELATED APPEALS AND INTERFERENCES

None